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August 2, 1999


Ms. Magalie R. Salas
Secretary
Federal Communications Commission
445 12th Street, S.W., TW-A306
Washington, D.C. 20554**Re: Comments of the North Carolina Association of Broadcasters and the
Virginia Association of Broadcasters, MM Docket No. 99-25**

Dear Ms. Salas:

Transmitted herewith on behalf of the North Carolina Association of Broadcasters and the Virginia Association of Broadcasters are an original and four (4) copies of Comments for filing in the above-captioned proceeding.

If any questions should arise during the course of your consideration of this matter, it is respectfully requested that you communicate with this office.

Sincerely,

BROOKS, PIERCE, McLENDON,
HUMPHREY & LEONARD, L.L.P.
Wade H. HargroveNo. of Copies rec'd
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Enclosures

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	MM Docket No. 99-25
)	
Creation of a)	RM-9208
Low Power Radio Service)	RM-9242

To: The Commission

**COMMENTS OF THE
NORTH CAROLINA ASSOCIATION OF BROADCASTERS AND
THE VIRGINIA ASSOCIATION OF BROADCASTERS**

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August 2, 1999

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Summary

The North Carolina Association of Broadcasters and the Virginia Association of Broadcasters oppose the proposals set forth in the Commission's *Notice of Proposed Rule Making* to create a new low power FM ("LPFM") service.

As an initial matter, the LPFM proposals contained in the *Notice*—or any LPFM proposals, for that matter—are premature: (1) In-band, on-channel ("IBOC") digital audio broadcasting ("DAB") standards have not been set; (2) the Commission has not yet completed its radio technical rules streamlining proceeding; and (3) the issues surrounding noncommercial educational ("NCE") comparative hearings have not been resolved. Each of these matters must be settled before any LPFM proposal can be fully and fairly evaluated. For example, the broadcast industry—and, significantly, the Commission itself—cannot adjudge the impact of significantly reduced interference protection in the LPFM context on DAB when the basis or benchmark for judgment has yet to be determined.

Substantively, LPFM is a mistake waiting to happen. Nearly every aspect of LPFM has already been tried or considered—and rejected—as the history of modern FM broadcasting (i.e., since 1961) unequivocally proves. It would be foolhardy to repeat these mistakes, especially since the laws of physics have not changed. The Commission's LPFM proposals are, unfortunately, short-sighted and ill-conceived. If implemented as envisioned they will wreak havoc on the technical integrity of the FM band and possibly destroy the small market AM broadcaster, the quintessential community radio voice. In addition, the Commission should not create new services and jeopardize the integrity of the FM band when hundreds of the current allotments are lying

fallow, and, in addition, hundreds more of existing broadcast stations can be purchased for less than the cost to build a new one.

The Commission's succinct reasoning nearly 40 years ago at the dawn of the modern FM era is fully applicable to LPFM: LPFM is past the "point of diminishing returns beyond which additional assignments on a channel, even though nominally protecting the 1-mv/m contour of existing stations, result in overall inefficiency of use." LPFM "perpetuate[s] an already undesirable situation, by encouraging the 'squeezing-in' of numerous assignments operating with near-minimum facilities." LPFM would have a tremendous preclusive effect "forever limit[ing]" existing full power stations "to their existing facilities."¹ Indeed, throughout the history of modern FM broadcasting, the Commission has properly been concerned with spectrum efficiency and congestion. Just last year, for example, the Commission voiced its view—a view at odds with the goals of its current LPFM proposals—that "[c]ongestion in the FM band provides a major technical impediment to the further 'urban clustering' of stations."²

In fact, the Commission has already examined the feasibility of low power FM radio and concluded, only four years ago, (1) that "we do not authorize low power FM radio broadcast stations because they cannot adequately serve communities and mobile audiences, and because they would preclude the establishment of more efficient, stable, full powered stations"³ and (2) that "the public

¹ *Revision of FM Broadcast Rules*, First Report and Order, 33 F.C.C. 309 (1962), at ¶ 29.

² *Streamlining of Radio Technical Rules*, Notice of Proposed Rule Making, FCC 98-117, 13 FCC Rcd 14849 (1998), at ¶ 18.

³ *Stephen Paul Dunifer*, FCC 95-333, 1 Comm. Reg. (P & F) 798 (1995), at ¶ 15.

interest would not be served by licensing a low power FM broadcast service.”⁴

Unless the Commission’s mandate has changed from radio engineering to social engineering, the Commission’s LPFM proposals cannot overcome their inherent technical limitations if the FM spectrum is to maintain any integrity at all. The Commission’s LP1000 and LP100 proposals are less spectrally efficient than all existing full power station classes. Indeed, the LP1000 class is the least efficient class of all; it is far less efficient than existing full-power stations, and it is even noticeably less efficient than its sister LPFM proposals. And, in the real world, with nearly 11,000 licensed FM facilities, the proposed LPFM classes are far less efficient than their theoretical optima. The reality of the FM band is that LPFM stations simply cannot be dropped into the current allotment grid without either severely increasing interference or destroying existing service.

Broadcasters in North Carolina and Virginia are particularly disturbed by the Commission’s proposals as already four of the ten “worst cases” for interference nationwide are located in North Carolina and Virginia. North Carolina and Virginia broadcasters, therefore, already operate in a particularly difficult interference environment vis-à-vis the rest of the country. Dropping in dozens, if not hundreds, of new LPFM stations in North Carolina and Virginia is simply not feasible, either technically or from a public interest point of view.

The shortcomings of LPFM are manifest even if current adjacent channel protections are maintained; if they are eliminated, existing FM service will not survive. For example, the Commission’s LPFM proposals ignore the fact that the effective service area of a broadcast station extends far beyond its protected contour. A typical car radio can get a good signal when the signal strength is only 40 dBu; moreover, the Commission previously recognized that stations’ secondary

⁴ *Id.* at ¶ 23.

service areas extended to the 34 dBu contour, which constituted a usable FM signal in rural areas. Empirical evidence demonstrates that numerous Arbitron-surveyed radio listeners—and not merely a theoretical potential audience—are, in fact, actually located near the periphery of stations' 34 dBu contours. Quite significantly, a substantial portion—on average, more than 34.5%—of a station's actual listening audience resides outside the station's protected contour. In some cases, nearly 9 out of 10 surveyed listeners live outside the station's protected contour. Therefore, were the Commission to jettison second and third adjacent channel interference protections for its LPFM proposals, it would be jettisoning much important *documented* service provided by existing full-power broadcasters and doing precisely what it has repeatedly stated it would not do.

The Commission has also previously acknowledged the merit in avoiding, through the process of repeatedly eating away at an existing station's service by authorizing second or third adjacent channel interference, the creation of a "Swiss cheese" coverage pattern for the original station. But the Commission's current LPFM proposals would create just such a "Swiss cheese" coverage pattern for existing broadcasters on a massive scale.

Furthermore, elimination of second and third adjacent channel interference protections, rather than increasing spectrum efficiency by adding a vast number of new stations, would actually decrease spectrum efficiency by possibly destroying existing FM subcarrier services. LPFM would essentially trade off radio reading services for the blind in order to appease radio pirates. The loss of listenership, due to elimination of these interference protections, for full power stations, when combined with the loss of service for the millions of blind, reading-impaired, and foreign language-speaking individuals who rely on current subcarrier programming, far outstrips the new service that could possibly be provided by the Commission's LPFM proposals, especially since virtually none of the new LPFM stations would provide a first primary service to anybody. Such

an extensive loss of existing service cannot possibly be in the public interest.

The Commission must apply its technical standards uniformly. The Commission's distinction that LPFM stations warrant elimination of current protection standards because they have lower power levels cannot withstand scrutiny, especially in a context in which numerous LPFM stations will be crammed into the usable 34 dBu or 40 dBu service areas of full power stations. If third (and second) adjacent channel interference protections are to be eliminated, then existing full power broadcasters, the primary providers of radio services, should be permitted to improve their facilities first, before the essentially secondary service of LPFM is even authorized.

Extensive engineering analyses, including the Commission's own, demonstrate the irrationality of the LPFM proposals. *Very* few LPFM stations can be assigned to the largest markets. The Commission's own analysis shows that in 18 of the 20 largest markets (those with populations greater than 500,000), **no** LP1000 *or* LP100 stations—zero—can be assigned whatsoever if current interference protection standards are maintained and translators are protected.⁵ This analytical result demonstrates that the Commission's goal of "serving urban communities and neighborhoods" by means of LPFM stations—as stated prominently in the *Notice's* very first paragraph—cannot be achieved, *ab initio*.

The enormous "Swiss cheese" effect created by dropping in thousands of new LPFM stations will destroy existing FM radio as we know it. As the Commission has previously stated:

Since it is *impossible*, under *any rational* assignment plan, to put individual stations in more than a small percentage of the many suburban communities clustered around our larger cities, we must try to see that as many of the central city stations as possible will be able

⁵ See *Notice*, Appendix D.

to cover all of the surrounding suburbs.⁶

The Commission's current goals and LPFM proposals can evidently only be made possible by an *irrational* plan. Obviously such irrationality does not serve the public interest and cannot withstand judicial scrutiny.

Despite the appearance of adequate theoretical efficiency for LP10 microradio stations, the Commission has already tried a technically similar service, the 10-watt Class D stations, and determined that, in the overall management of radio broadcast services, the Class D stations are not efficient enough. In fact, the Commission concluded that, in actuality, a low power operation in a densely populated area "only masks the innate inefficiency of the 10-watt station's coverage when compared to its potential for causing interference. *The result of labeling the inefficient as efficient is to preclude taking steps to improve matters.*"⁷

In any event, the Commission's LPFM proposals are not necessary to serve small towns and communities. This country already has an extensive network of community-oriented radio stations, viz. existing small market broadcasters, especially small market AM broadcasters. Creation of an extensive LPFM service will, ironically, result in less diversity in radio voices and program services since, in fact, its real result will be the demise of the very community-oriented radio service the Commission claims it wants to foster.

In addition, LPFM will not necessarily increase opportunities for women and minorities to own broadcast stations. The Commission is well aware that for new commercial licenses or

⁶ *Revision of FM Broadcast Rules*, Third Report, Memorandum Opinion and Order, FCC 63-735, 23 Rad. Reg. (P & F) 1859 (1963), at ¶ 9 (emphases added).

⁷ *Noncommercial Educational FM Broadcast Stations*, Memorandum Opinion and Order, FCC 78-919, 44 Rad. Reg. 2d (P & F) 1685 (1979) ("*Reconsideration of Second Report and Order*"), at ¶ 15.

construction permits it must proceed by an auction system. However, even with the use of a new entrant bidding credit, there can be no assurance in an auction scenario that a minority or female, vis-à-vis a white male, will be the successful bidder. And if all LPFM stations are to be noncommercial, then, because the Commission has yet to resolve the selection methodology for competing applications, the LPFM *Notice* is premature. Even if the Commission could construct a legal mechanism to help assure that women and minorities would especially benefit from LPFM, the Commission must not either create the *appearance* of directing female and minority broadcasters to inferior facilities or, *in fact*, have burdened female and minority broadcasters with inferior facilities. But, by definition, LPFM, as a secondary service, is an inferior second-class service. Quite simply, LPFM is not—and cannot be—an acceptable solution to whatever difficulties women and minorities may face in the broadcasting industry.

Furthermore, LPFM will not be a panacea for the pirate problem. The enforcement and administrative difficulties that will result from authorizing thousands of new LPFM stations, and turning them over to broadcasting neophytes, will stretch the Commission's already-limited resources beyond their capacity. In this environment, it will become even more difficult to police and prosecute the pirates. Radio anarchists will thrive as a consequence of LPFM.

NCAB and VAB strongly oppose the creation of any LPFM service.⁸ The Commission must act as the steward of the public's airwaves. Yet virtually every aspect of LPFM contravenes

⁸ Although NCAB and VAB oppose the LPFM proposals in their entirety, NCAB and VAB provide counter-proposals, *see* part XI, *infra*, should the Commission decide to further consider implementing any LPFM service.

Commission precedent, and the laws of physics have not changed in the meantime. It would be tragic indeed should radio, in the century that began with Marconi, end as inferior macaroni—all holey and aurally unpalatable.

* * *

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	MM Docket No. 99-25
)	
Creation of a)	RM-9208
Low Power Radio Service)	RM-9242

To: The Commission

**COMMENTS OF THE
NORTH CAROLINA ASSOCIATION OF BROADCASTERS AND
THE VIRGINIA ASSOCIATION OF BROADCASTERS**

I. Preliminary Statement

The North Carolina Association of Broadcasters ("NCAB") and the Virginia Association of Broadcasters ("VAB"), by their attorneys, hereby file the following comments in response to the *Notice of Proposed Rule Making* ("Notice"), FCC 99-6, released February 3, 1999, in the above-captioned proceeding. The *Notice* seeks comment on a wide variety of issues related to whether the Commission should establish three new classes of low power radio or microradio service in the FM band.

NCAB is a voluntary non-profit trade association of some 131 radio and 29 television stations in North Carolina. VAB is a voluntary non-profit trade association of some 104 radio and 22 television stations in Virginia. NCAB and VAB oppose the proposals set forth in the *Notice*. As shown below, low power FM is premature, is an inefficient use of spectrum and technically irrational, will destroy radio reading services for the blind and other subcarrier services, will devastate existing small market community broadcasters, will not increase opportunities for women

and minorities to own broadcast stations, and will not solve the pirate problem. Indeed, virtually every aspect of low power FM contravenes Commission precedent and experience. In short, low power FM is a mistake that need not—and should not—happen.

II. Any Low Power FM Proposals Are Premature

Without a doubt, the LPFM proposals contained in the *Notice*—or any LPFM proposals, for that matter—are premature: (1) In-band, on-channel (“IBOC”) digital audio broadcasting (“DAB”) standards have not been set; (2) the Commission has not yet completed its radio technical rules streamlining proceeding; and (3) the issues surrounding noncommercial educational (“NCE”) comparative hearings have not been resolved. Each of these matters must be settled before any LPFM proposal can be fully and fairly evaluated.

The Commission stated repeatedly in the *Notice* that it was concerned that LPFM could limit the development of terrestrial digital radio services,¹ as did each of the Commissioners in their separate statements.² Indeed, the Commission acknowledged its own lack of knowledge of the

¹ See *Notice* at ¶¶ 1 (stating that the Commission will be “wary of any [LPFM] provisions that would limit the development of terrestrial digital radio services”), 29 (“We are also concerned whether an LP1000 service would limit or impair the ability of full power stations to implement digital transmission technology such as in-band-on-channel (‘IBOC’) conversion.”), 33 (same, with regard to LP100 stations), 36 (same, with regard to microradio stations), 47 (stating that it is important “to take into consideration the implications of 2nd-adjacent channel protection for the possible conversion of existing analog radio services to a digital mode), 49 (acknowledging that the Commission’s “understanding of future IBOC systems is preliminary and that we may not be fully aware of any negative impact or restrictions that authorization of low power radio service would have on the transition to digital IBOC technology for FM stations”); see also *id.*, Appendix C, ¶ 1 (stating that “the Commission is committed to facilitating this transition [to digital] in an orderly and systematic manner”).

² See Joint Statement of Chairman Kennard and Commissioner Tristani at 1 (“[W]e are mindful of the conversion to digital . . . and we will do our part to make sure that local radio is not left on the sidelines of the digital revolution.”); Statement of Commissioner Ness at 1 (stating that
(continued...)

effects of reduced interference protection resulting from the LPFM proposals on IBOC development.³ Paragraph 49 of the *Notice* is nothing but a long laundry list of questions on the potential technical impact of LPFM on IBOC DAB, and Appendix C of the *Notice* essentially juxtaposes the distinct views of USA Digital Radio (“USADR”) and the National Association of Broadcasters (“NAB”) on second and third adjacent channel interference considerations and then seeks comments.

For the past decade, numerous parties have worked assiduously to develop IBOC DAB so as not to require additional spectrum, as digital television required, while concomitantly preserving existing analog radio service during the transition. The advantages of an IBOC technological solution to the conversion of radio broadcasting to digital transmission are obvious. But the challenges have been monumental. Only recently has one party, USADR, believed that sufficient progress has been made as to warrant the Commission initiating a new rulemaking proceeding.⁴

²(...continued)

one of the issues at the “forefront” is “whether and to what extent these [LPFM] services would adversely affect the potential transition of existing broadcasters from analog to digital through an ‘In Band On Channel’ (IBOC) system”); Statement of Commissioner Powell at 1 (expressing concern that “authorizing some or all of these low power radio services would make in band on channel conversion to digital radio unworkable for existing terrestrial services”); Dissenting Statement of Commissioner Furchtgott-Roth at 2 (noting that the “creation of low power radio by elimination or modification of current interference rules” may “hinder[] the development of new, advanced services such as in-band, on-channel digital radio” and “make it harder for the FM radio band to keep up” with the communications industry’s “moves toward the advantages of digital technology”).

³ See *Notice* at ¶ 49; *id.*, Appendix C, ¶ 3 (stating, with regard to the effects of eliminating third adjacent channel interference protection, that “[b]ecause no comprehensive operational test data is available for any form of IBOC system configuration, we do not know whether USADR or NAB is correct”)

⁴ See *Amendment of Part 73 of the Commission’s Rules to Permit the Introduction of Digital Audio Broadcasting in the AM and FM Broadcast Services*, RM-9395, Petition for Rulemaking of
(continued...)

Other IBOC developers, such as Lucent Technologies, question whether it is too soon for Commission rulemaking given the lack of comprehensive field testing of the various IBOC technologies.⁵ Virtually all of the parties, however, agree that it will be necessary for the Commission, as the expert agency, to set IBOC DAB standards.⁶ Yet the Commission has yet to act on the USADR Petition, let alone promulgate such standards. NCAB and VAB seriously question how the broadcast industry—and, significantly, the Commission itself—can adjudge the impact of significantly reduced interference protection in the LPFM context on DAB when the basis or benchmark for judgment has yet to be determined.

As USADR states upfront:

IBOC DAB must be introduced into the already very complex interference environment which exists today in the AM and FM bands. In order to insure the continued viability of existing analog radio during the transition from analog to digital and simultaneously provide an environment for DAB to prosper, the Commission must develop interference protection criteria.⁷

But before the Commission has set the necessary interference protection criteria, the LPFM proposals would, perhaps insuperably, complicate that “already very complex” interference environment. And while NCAB and VAB have little doubt that receiver manufacturers might be able to design new DAB receivers that would be able to reject the increased unwanted interference,

⁴(...continued)

USADR (filed Oct. 7, 1998); *see also* Public Notice, DA 98-2244 (Nov. 6, 1998) (seeking public comment on the USADR Petition).

⁵ *See, e.g.*, Comments of Lucent Technologies, Inc., RM-9395 (filed Dec. 23, 1998), at 18.

⁶ *See, e.g.*, USADR Petition for Rulemaking, RM-9395 (filed Oct. 7, 1998), at 8; Comments of NAB, RM-9395 (filed Dec. 23, 1998), at 8; Comments of Lucent Technologies, RM-9395 (filed Dec. 23, 1998), at 22.

⁷ USADR Petition for Rulemaking, RM-9305 (filed Oct. 7, 1998), at iii.

that design decision may well come at the expense of higher fidelity, one of the principal advantages of digital radio—and one, no doubt, that consumers will both demand and expect.

Clearly, this LPFM proceeding is not the proper administrative avenue by which to determine these important matters. The record for IBOC DAB has not been sufficiently developed. NCAB and VAB, other members of the broadcast industry, and the Commission have had the opportunity to consider only one preliminary IBOC DAB proposal but none of the details of competing proposals. Until the advantages and disadvantages of all of the proposals have been scrutinized and the Commission, after public input, has promulgated the necessary standards, it is plainly premature to even consider, let alone actually undertake, any other fundamental alteration of our country's radio broadcasting system. NCAB and VAB fail to see the benefits of potentially jeopardizing the IBOC conversion to digital radio by needlessly rushing to create new LPFM services for which the possibly debilitating effects on full-service radio broadcasting remain unknown. There is simply no good policy reason to put the LPFM cart before the IBOC DAB horse.

Notwithstanding the technical standard-setting necessary for the conversion to digital radio, the Commission has proposed other, significant changes to the technical standards governing the FM broadcast service which it has yet to formally resolve.⁸ Although the Commission has recently acted to extend first come/first served processing to certain minor change applications; expanded the definition of "minor change" for the AM, NCE-FM, and FM translator services; and newly permitted the filing of contingent applications,⁹ the vast majority of the technical changes the Commission put

⁸ See *Streamlining of Radio Technical Rules*, Notice of Proposed Rule Making, FCC 98-117, 13 FCC Rcd 14849 (1998) ("*Radio Technical Rules Streamlining Notice*").

⁹ See *Streamlining of Radio Technical Rules*, First Report and Order, FCC 99-55 (released Mar. 30, 1999).

in issue in the *Radio Technical Rules Streamlining Notice* remain to be determined. In particular, still open are negotiated interference agreements, the adoption of a point-to-point contour prediction method, reduced minimum separation requirements for second and third adjacent channels, the possible creation of new Class C0 stations with reduced spacing requirements for the new class, the relaxation of second adjacent channel interference ratios for predicting prohibited overlap in the reserved band, and revisions to the Class D rules.

These possible changes represent a significant rewriting of the technical rules that govern FM broadcasting. It would be premature to attempt to implement LPFM services before the possible cumulative effect of these new changes can be assessed. For example, it is not known to what extent these technical rules streamlining proposals will affect the interference environment of the FM band. But until that cumulative effect is known, there is no way to gauge the separate effect of the Commission's LPFM proposals to eliminate second and third adjacent channel interference protection on the technical integrity of the FM service.

In addition, however the technical rules are modified, it is patently unfair to existing licensees not to allow them to improve their facilities based on the new modified rules prior to their being precluded from doing so by LPFM stations. The efforts of streamlining will have been wasted if licensees are unable to take advantage of the efficiencies the modified rules are intended to encourage.

Again, NCAB and VAB fail to see the public interest benefits in needlessly rushing to add further complexity to the FM band before the existing technical rules are put in order.

Finally, the Commission has yet to resolve the process of choosing among competing applicants for NCE-FM broadcast stations. The Commission has recently proposed the possibility

of using lotteries or, alternatively, a point system to award NCE-FM spectrum.¹⁰ The methodology for selecting among competing NCE-FM applicants may well be critical in any LPFM undertaking as the Commission is considering that any LPFM service be noncommercial.¹¹

If LPFM services were permitted to be commercial in the non-reserved band, then mutually exclusive applications would have to be resolved by auction pursuant to statute.¹² If all LPFM services were required to be noncommercial, then clearly one possibility is that competing applications would be resolved through lottery, just as the Commission has proposed for full power NCE-FM competing applications. Yet these two selection methodologies—auctions and lotteries—are critical to the Commission's entire LPFM proposal, for under either method it is clear that the Commission cannot ensure that the fundamental goals of a new LPFM service—to “address unmet needs for community-oriented radio broadcasting, foster opportunities for new radio broadcast ownership, and promote additional diversity in radio voices and program services”¹³—will possibly be met. It is especially evident that under either an auction or lottery methodology there can be no assurance that minorities or women will become owners.

Because the means to resolve competing full power NCE-FM applications loom so large over the selection methodology for LPFM applicants, NCAB and VAB do not believe the Commission's LPFM proposals can be meaningfully evaluated in terms of the likelihood of their fulfilling the Commission's stated goals until the full power NCE-FM competing applicant issue is finally

¹⁰ See *Reexamination of the Comparative Standards for Noncommercial Educational Applicants*, Further Notice of Proposed Rule Making, FCC 98-269 (released Oct. 21, 1998).

¹¹ See, e.g., *Notice* at ¶¶ 2, 19, 24, 30, 34, 108.

¹² See 47 U.S.C. § 309(j).

¹³ *Notice* at ¶ 1.

determined. In addition, NCAB and VAB are especially concerned that the full power NCE-FM mutually exclusive applications issue will be resolved, not on its own merits, but because of its likely effect on the LPFM situation. The public interest would be better served by resolving an important outstanding matter instead of rushing needlessly to create a new service which may prove inextricably linked to the former.

In sum, at least three critical matters—standards for IBOC DAB, modified technical rules for the FM band, and a resolution mechanism for competing full power NCE-FM applicants—await determinative Commission action. NCAB and VAB respectfully submit that the Commission, pursuant to its obligation to act in the public interest, should finally resolve each of these matters before proceeding to consider any LPFM proposal. Only in this way can the real implications of LPFM for FM service be truly determined. To act prematurely, needlessly, raises difficult questions about the Commission's stewardship of the public's airwaves.

III. Under Commission Precedent, the LPFM Proposals Are an Inefficient Use of Spectrum

Currently there are 12,560 licensed radio stations in the United States, including 5730 commercial FM stations and 2049 NCE-FM stations.¹⁴ In addition, there are 3196 FM translators and boosters.¹⁵ Virtually every community in the United States, and certainly those in the conterminous 48 states, receives aural service. In fact, the vast majority of Americans can receive service from numerous radio stations. Radio is a remarkably dynamic and diverse medium that has informed and entertained the American people for more than 75 years.

¹⁴ See *Broadcast Station Totals As of June 30, 1999* (released July 19, 1999).

¹⁵ See *id.*

Radio has come a long way from its chaotic monophonic origins in the 1920s. The Commission is well aware that it was originally created to bring order to and manage the radio broadcast spectrum. The fact that the nearly 11,000 licensed FM facilities provide, on the whole, interference-free service to their listeners is a testament to the Commission's stewardship.

This is not to say that mistakes have not been made along the way. The AM band, most notably, is an interference-muddled mess. But the Commission has attempted to avoid repeating its mistakes—once burned, twice shy—and, heretofore, it has largely avoided the “AM-ization” of the FM band.

LPFM is a mistake waiting to happen. Nearly every aspect of LPFM has already been tried or considered—and rejected—as the history of modern FM broadcasting (i.e., since 1961) unequivocally proves. It would be foolhardy to repeat these mistakes, especially since the laws of physics have not changed. The Commission's LPFM proposals are, unfortunately, short-sighted and ill-conceived. If implemented as envisioned they will wreak havoc on the technical integrity of the FM band and possibly destroy the small market AM broadcaster, the quintessential community radio voice.

As an initial matter, it is far from clear that LPFM is even necessary. Under the current allotment scheme, there are hundreds of full power allotments available now. When to this number are added the hundreds of existing stations that could be purchased for less than the cost of building a new one, it quickly becomes apparent that there are more than a thousand opportunities awaiting would-be broadcasters. If so many LPFM proponents are clamoring for the new services, why are so many opportunities lying fallow? The two most likely answers from LPFM proponents—(1) they are too expensive and (2) they are not in the right locations—fail even a cursory scrutiny when seen in the light of the Commission's *Notice*.

First, the Commission proposes two new LPFM services, a 1000 watt maximum ERP primary service, LP1000, and a 100 watt maximum ERP secondary service, LP100.¹⁶ The Commission has not proposed, but only seeks comments on, a third LPFM service, microradio, with ERP levels in the 1 to 10 watt range (hereinafter “LP10”).¹⁷ Yet, from the point of view of the current scheme, both LP1000 and LP100 can be practically subsumed by the current Class A classification. While a Class A station has a maximum permissible ERP of 6000 watts, it has a minimum allowable ERP of only 100 watts.¹⁸ The expense of owning and operating a LP1000 or LP100 station would be virtually the same as owning and operating a Class A station licensed with an ERP from 100 to 1000 watts. And, moreover, in the case of a Class A station, there would be no question of secondary service when licensed at only 100 watts. Any would-be broadcaster, therefore, that would apply for a LP1000 or LP100 license could, today, apply for one of the numerous available Class A allotments that are currently lying fallow.

Second, as for location, the Commission’s *Notice* makes clear that the vast majority of potential new LP1000 and LP100 stations will be available, not in the top 10 or 30 markets, but in smaller communities across the country.¹⁹ Yet this is precisely where the vast majority of currently fallow allotments are.

In short, the Commission should not create new services and jeopardize the integrity of the FM band when the current allotments are not even fully utilized.

¹⁶ See *Notice* at ¶¶ 23-33.

¹⁷ See *id.* at ¶¶ 34-37.

¹⁸ See 47 C.F.R. § 73.211.

¹⁹ See *Notice*, Appendix D.

Notwithstanding the illogic of creating a new low power service when the existing full power service is not fully utilized, the Commission's LPFM proposals do not survive the scrutiny of the Commission's own precedent. Throughout the history of modern FM broadcasting, the Commission has been acutely concerned with spectrum efficiency and the problems of congestion in the FM band. Thus, in constructing the modern assignment scheme in the early 1960s, the Commission began with the fundamental notion that, in order to provide some service of satisfactory signal strength to all areas of the country and to provide as many program choices to as many listeners as possible, it is necessary that stations be

able to serve *wide* areas—operating with as high power and antenna height as is practical, and protected from interference out to the point where their signals become too weak to be generally useful, or nearly to that point. Only by this means, it appears, can service be provided to rural areas and sparsely settled portions of the nation. *The same result cannot be obtained from assignment of a large number of low-powered, more closely spaced stations*, for the reason that a station causes destructive co-channel interference over an area much wider than that within which it renders a useful service, so that there will always be wide gaps between the service areas of co-channel stations.²⁰

Indeed, the Commission at that time expressly rejected a proposal that would permit a great number of low-powered assignments for three critical reasons, all of which remain relevant to the current LPFM proposals. The Commission termed it

a “squeeze-in” proposal, under which any combination of facilities (no matter how small), and directional antennas suppressing radiation in particular directions, would be permitted as long as existing 1-mv/m contours are protected. It must be rejected, for a number of reasons. First, there is the consideration of the overall efficiency of channel use. As far as cochannel and first adjacent-channel

²⁰ *Revision of FM Broadcast Rules*, Notice of Inquiry, Notice of Proposed Rule Making, and Memorandum Opinion and Order, FCC 61-833, 21 Rad. Reg. (P&F) 1655 (1961), at ¶ 7 (emphases added).

operations are concerned, any new assignment creates interfering signals over much greater distances than the extent of its service area—thus creating islands of service in the midst of seas of interference. If protection is only to the 1-mv/m contour of existing stations, service outside that contour (which many stations render) will be destroyed. There comes a point of diminishing returns beyond which additional assignments on a channel, even though nominally protecting the 1-mv/m contour of existing stations, result in overall inefficiency of use. Second, this plan would merely tend to perpetuate an already undesirable situation, by encouraging the “squeezing-in” of numerous assignments operating with near-minimum facilities—an inefficient use of channels, especially those designed for use by medium or higher power stations. Third, existing stations (both those now in existence, and those which might be authorized from now on under such a system) would be forever limited to their existing facilities—often the small and (from an assignment standpoint) inefficient facilities referred to above.²¹

LPFM is past the “point of diminishing returns beyond which additional assignments on a channel, even though nominally protecting the 1-mv/m contour of existing stations, result in overall inefficiency of use.” LPFM “perpetuate[s] an already undesirable situation, by encouraging the ‘squeezing-in’ of numerous assignments operating with near-minimum facilities.” LPFM would have a tremendous preclusive effect “forever limit[ing]” existing full power stations “to their existing facilities.”

The Commission further recognized that the result of the “pressure to ‘squeeze-in’ stations” would be “to clutter up many of these channels with a number of small-scale facilities, making for inefficient channel use.”²² Even then, when the FM band was much less congested than it is today, the Commission expressly rejected a proposal to permit 10-watt stations to be assigned on the 20 Class A station channels because “such use of the class A channels—on which numerous

²¹ *Revision of FM Broadcast Rules*, First Report and Order, 33 F.C.C. 309 (1962), at ¶ 29.

²² *Id.* at ¶ 49.

assignments must be made to accommodate the needs of smaller communities—is completely inconsistent with efficient use of these channels.”²³

In fact, while carefully designing the modern assignment system, the Commission declared the unsoundness of a LPFM-type schema to be an undebatable “truism”:

Any system of station assignments necessarily represents a series of compromises designed to strike a balance between two extremes. One extreme is represented by a plan under which relatively few stations would be assigned on each channel, each station operating with the greatest facilities reasonably practical to construct and each station protected to the point at which its signal is rendered unusable by background and receiver noise. The other extreme would see thousands of small stations, each interfering with many other stations and interfered with in turn, so that the average protected service area would extend only a few miles from the station’s transmitter site. Neither of the two extremes approaches optimum efficiency from a strictly engineering point of view and, quite clearly, neither represents a desirable plan as a matter of non-engineering policy. About these general truisms there can be little debate.²⁴

Again, even at a time when FM band congestion was much less severe, the Commission feared that numerous low-powered stations would result in the “AM-ization” of the FM band. From a development perspective, there was no point in repeating past mistakes, which would destroy the unique qualities of FM:

Departing from past practice in the AM service, where 90% of existing stations operate with one kilowatt of power or less, we have set aside 75% of all commercial FM channels for stations which will be able to provide interference-free service over relatively wide areas and we have adopted mileage separations which will allow a large proportion of these stations to achieve maximum facilities. These decisions reflect our judgment that the wide coverage FM station is

²³ *Id.* at ¶ 117.

²⁴ *Revision of FM Broadcast Rules*, Third Report, Memorandum Opinion and Order, FCC 63-735, 23 Rad. Reg. (P & F) 1859 (1963), at ¶ 15.

the vehicle by which FM may best be developed as a complementary aural service to AM. In previous paragraphs we noted four specific areas of need in which wide coverage FM stations may play vital roles not wholly fulfilled by AM services: (a) the need to provide service from central city stations to burgeoning suburban communities; (b) the need to provide primary aural service to nighttime 'white areas' lying some distance from large communities; (c) the need to provide the best possible stereophonic transmission over stations which must be spaced on the basis of assumed monaural services; and (d) the need to provide signals of adequate strength to serve what is expected to be a substantially increased FM automotive audience in the future. . . . Except in the most concentrated centers of population, [minority and specialized programming] cannot achieve maximum success without a relatively extensive service area. *A station providing interference-free coverage for a radius of only ten or fifteen miles is seldom able to provide service to enough people interested in limited appeal programming to survive. . . .*

We have concluded that the factors set forth above outweigh the benefits which would be derived from an FM system having a substantially greater number of stations with more limited service areas. . . . We recognize the value of local outlets and, indeed, have done our best to provide as many local assignments as possible, consistent with achievement of our other goals. We do not believe, however, that there is a great enough need for still more local outlets to justify a reduction in the spacings underlying th[e] Table of Assignments. We feel that a substantial reduction in minimum FM spacings may force the FM service into the same mold as the developed pattern of assignments in standard broadcast. Under such a pattern, in which FM stations would be distinguishable from AM stations only by the frequencies upon which they operated, the FM service would be merely cumulative, rather than complementary, to the AM service, performing the same functions that AM already performs quite well. Such a development would, in our opinion, represent a waste of FM's unique potential.²⁵

The Commission's proper concern with spectrum efficiency and congestion has not been limited to those early years of modern FM broadcasting. Time and again the Commission has observed that "[s]pectrum space is scarce and is becoming more so. In fact, in many parts of the

²⁵ *Id.* at ¶¶ 19-20 (emphasis added).

country, there is little or no spectrum space available to accommodate additional services.”²⁶ In fact, just last year, as part of the radio technical rules streamlining proceeding, the Commission again noted that “[i]ncreasing congestion in both the reserved and non-reserved portions of the FM band limit options for operating stations to relocate to better transmitter sites and reach additional listeners,”²⁷ and voiced its view—a view at odds with the goals of its current LPFM proposals—that “[c]ongestion in the FM band provides a major technical impediment to the further ‘urban clustering’ of stations.”²⁸

More strikingly, just four years ago, the Commission considered the nature of low-powered FM service, especially in the context of spectrum efficiency, and flatly rejected it. Because the Commission’s sound conclusions in that matter are diametrically opposed to the Commission’s current LPFM proposals, it is instructive to quote extensively from the Commission’s order:

[A] low power station could not co-exist with a nearby high power station; the interference received would be too destructive. However, at the edge of the high power station’s protected service contour, where its signal is weakened by distance, a low power station could operate because the interference received by the low power station would be tolerable for a secondary operation. *But this is unacceptable from a public interest standpoint* because the low power station would cause objectionable interference to the reception by the

²⁶ *Noncommercial Educational FM Broadcast Stations*, Second Report and Order, FCC 78-384, 44 Rad. Reg. 2d (P & F) 235 (1978), at ¶ 42. See also *Review of Technical Parameters for FM Allocation Rules*, Second Report and Order, FCC 87-296, 63 Rad. Reg. 2d (P & F) 1262 (1987), at ¶ 34 (“The FM allocation is becoming increasingly occupied, and continuing to grant routinely modification requests that increase the probability of interference tends to run counter to our objective promoting efficiency in the use of this spectrum.”); *FM Translator and Booster Stations*, Report and Order, FCC 70-1042, 20 Rad. Reg. 2d (P & F) 1538 (1970), at ¶ 8 (“East of the Mississippi and in Zone 1-A, the frequency congestion is such that we believe it necessary to restrict power [to one watt] in order to avoid a multitude of interference problems.”).

²⁷ *Radio Technical Rules Streamlining Notice* at ¶ 3.

²⁸ *Id.* at ¶ 18.

audience of the primary station's signal. Such interference to the primary station could be difficult to identify and correct, and *would serve to lower the quality of the FM broadcasting service.*²⁹

* * *

The Commission, therefore, does not allow low power FM radio broadcasting because it is an inefficient use of the spectrum nor do we permit the highest power that the technology could achieve because that would reduce the number of stations, and consequently, the diversity of voices.³⁰

* * *

[W]e do not authorize low power FM radio broadcast stations because they cannot adequately serve communities and mobile audiences, and because they would preclude the establishment of more efficient, stable, full powered stations.³¹

* * *

Permitting low power facilities . . . would lead to a larger number of stations but less overall service. Simply put, full power broadcast facilities are more spectrally efficient.³²

* * *

If we treat preclusion as a cost and service as a benefit, the cost/benefit ratio improves with power; but the ratio is very poor for low powered stations.³³

* * *

²⁹ *Stephen Paul Dunifer*, FCC 95-333, 1 Comm. Reg. (P & F) 798 (1995), at ¶ 14 (emphases added).

³⁰ *Id.* at ¶ 15 (emphasis added).

³¹ *Id.*

³² *Id.* at ¶ 17.

³³ *Id.* at ¶ 18.

[T]he Commission . . . has concluded that the public interest would not be served by licensing a low power FM broadcast service.³⁴

NCAB and VAB submit that the Commission itself, in the *Notice*, has presented no reasoned arguments—indeed, no arguments at all—as to how its current LPFM proposals can be squared with these straightforward, on-point conclusions, which are unimpeachable from a technical standpoint. Indeed, unless the Commission’s mandate has changed from radio engineering to social engineering, NCAB and VAB further submit that the Commission’s LPFM proposals cannot overcome their inherent technical limitations if the FM spectrum is to maintain any integrity at all.

The inherent inefficiency of low power stations can be quantified. In Docket 14185, the Commission showed that theoretically a triangular lattice pattern of station arrangement provides for the greatest number of stations on a channel and thus that spectrum efficiency, in terms of the percentage of area covered, could be determined by the following formula:

$$\text{Efficiency} = 200 A / (S^2 \sqrt{3}) \approx 363 (R/S)^2$$

where S is the spacing between stations, A is the service area of each station, and R is the service radius.³⁵ As a general matter, the Commission observed that “lowest efficiency results from using low-power stations protected to the 1 mv/m contour, while highest efficiency results from using high-power stations protected to that contour,” and that “[a]s to any particular height and power, efficiency does not vary greatly with [the] extent of protected area and resulting spacing.”³⁶

³⁴ *Id.* at ¶ 23.

³⁵ See *Revision of FM Broadcast Rules*, Notice of Inquiry, Notice of Proposed Rule Making, and Memorandum Opinion and Order, FCC 61-833, 21 Rad. Reg. (P&F) 1655 (1961), at ¶ 39.

³⁶ *Id.* at ¶ 40.

Efficiency of FM Station Classes**Table 1**

Class	Distance to Protected Contour (km)	Minimum Distance Separation for Co-Channel Station of Same Class (km)	Efficiency %
C	92	290	36.5
C1	72	245	31.4
C2	52	190	27.2
C3	39	153	23.6
A	28	115	21.6
LP1000	14.2	65	17.3
LP100	5.6	24	19.8
LP10	3.2	13	22.0

The accompanying chart compares the inherent optimum theoretical efficiency of each class of station by considering the service area of each class type, assuming maximum facilities and protection to the 60 dBu F(50,50) contour, with regard to the minimum spacing necessary for a co-channel station of the same class.³⁷ As the chart shows, the Commission's LP1000 and LP100

³⁷ Because Class B stations are protected to the 54 dBu F(50,50) contour and Class B1 stations are protected to the 57 dBu F(50,50) contour, their inherent theoretical efficiencies are not directly comparable and thus they are excluded from the chart in the text. However, were, as an abstract matter, the various LPFM classes protected to these contours, instead of their 60 dBu (continued...)

proposals are far less spectrally efficient than existing full power station classes.

Indeed, the LP1000 class, at 17.3% efficiency, is the least efficient class of all; it is far less efficient than existing full power stations, and it is even noticeably less efficient than its sister LPFM proposals. Class C stations are 111% more efficient than LP1000 stations. Even Class A stations, the least efficient full power class of stations, are 25% more efficient than LP1000 stations. LP1000 stations are 21% less efficient than the suggested microradio LP10 stations.

The LP100 class, with an efficiency of 19.8%, is the second least efficient class of all. Class C stations are 84% more efficient than LP100 stations, and Class A stations are 9% more efficient.

That the LP1000 and LP100 classes represent inefficient uses of spectrum is hardly surprising. The Commission previously found the old Class A, with maximum ERP of 3 kW, to be

³⁷(...continued)

F(50,50) contours, their efficiencies would still be noticeably less than that of Class B and B1 stations, as the following abbreviated chart shows:

Table 2

Class	Efficiency	Efficiency
	% (assuming protection to 54 dBu contour)	% (assuming protection to 57 dBu contour)
B	16.9	—
B1	—	18.0
LP1000	10.1	13.0
LP100	9.3	12.6
LP10	11.5	14.5

An analysis similar to that provided in the text could be applied as well in comparing the relative efficiencies of Class B and B1 stations with the low-power classes. The conclusion—that low power stations are fundamentally inefficient—is exactly the same.

too inefficient, and it consequently raised the maximum ERP for Class A stations to its current 6 kW. As noted above, the LP1000 and LP100 classes can really be subsumed within Class A. Lower power levels within Class A necessarily represent less efficiency.

Only the suggested microradio LP10 stations merit consideration from a strictly theoretical efficiency viewpoint. They are approximately as spectrally efficient as the least efficient full power stations, the Class A stations. However, LP10 stations are virtually clones of Class D stations, and the Commission has already determined that the limitations of Class D stations outweigh their benefits.³⁸

IV. Interference Protection Standards Should Not Be Eliminated or Relaxed for LPFM Purposes

Of course, the Commission with its LPFM proposals is not starting with a *tabula rasa*. In the real world, with nearly 11,000 licensed FM facilities, the proposed LPFM classes are far less efficient than their theoretical optima. The existing FM band exhibits a tension between, on the one hand, a complex interference environment in which sometimes severe interference encroaches upon protected contours much more than is predicted, and, on the other hand, the well-established fact that, in the absence of interference, radio stations provide service far beyond their protected contours. *The reality of the FM band is that LPFM stations simply cannot be dropped into the current allotment grid without either severely increasing interference or destroying existing service.*

A. North Carolina and Virginia Broadcasters Already Operate in One of the Most Interference-Laden Areas in the United States

Recently, USA Digital Radio, as part of its IBOC DAB Petition, submitted an extensive

³⁸ See part VI, *infra*.

study of existing interference in the FM band.³⁹ The study was confined to the non-reserved band and did not consider third adjacent channel interference. The study contained some startling results, especially from NCAB and VAB's perspective. Consider the following:

- ▶ FM interference within areas normally protected from interference is more widespread than would be intuitively expected.⁴⁰
- ▶ 3280 commercial FM stations (approximately 60% of all such stations) have at least one short spacing.⁴¹
- ▶ In the non-reserved band, there are approximately 1870 cases of second adjacent channel short spacings, and, of these, 270 represent cases where the interfering station is within the desired station's protected contour.⁴²

Even more surprising, North Carolina exhibited a messier interference environment than any other Zone II state. When overlapping coverage and interference contours are illustrated on a map, approximately two-thirds of North Carolina and virtually all of Virginia, a Zone I state, are subsumed by these areas. *See* Exhibit 2.⁴³ Significantly, two of the top three "worst cases" of interference in the entire country are located in North Carolina (#1) and Virginia (#3). And of the ten "worst cases" of interference, three are located in North Carolina, more than any other state, even

³⁹ *See* USADR Petition for Rulemaking, RM-9395 (filed Oct. 7, 1998), at Appendix D (hereinafter "*Existing FM Interference Study*"). The study was conducted by Moffett, Larson & Johnson, Inc.

⁴⁰ *See Existing FM Interference Study* at iv. Of course, the Commission has long recognized that "[a]ctual interference may exist, to particular listeners at particular locations, even where under the curves as adopted there would be no 'objectionable interference' within the ratios and other provisions of the rules." *Revision of FM Broadcast Rules*, First Report and Order, 33 F.C.C. 309 (1962), at ¶ 79.

⁴¹ *See Existing FM Interference Study* at 3.

⁴² *See id.*

⁴³ Exhibit 2 reproduces *Existing FM Interference Study*, Figure 1.

including Zone I and Zone I-A states. Of the remaining seven “worst cases,” six are in Zone I or Zone I-A states, including the one in Virginia, and only one other is located in a Zone II state. Thus, overall, four of the ten “worst cases” for interference are located in North Carolina and Virginia.

The following table summarizes the percentages of total area and total population lost within the purportedly *protected* coverage area of these four “worst-case” North Carolina and Virginia stations⁴⁴:

Representative Losses Due to Interference Within Protected Contours **Table 3**
North Carolina and Virginia Stations

Station	Area Lost %	Population Lost %
WIST Channel 252A Thomasville, NC	70.2	67.8
WJFK Channel 294B Manassas, VA	41.9	29.5
WQMG Channel 246C Greensboro, NC	13.6	10.9
WKBC Channel 247C North Wilkesboro, NC	9.0	11.7

The *Existing FM Interference Study* therefore demonstrates that North Carolina and Virginia broadcasters already operate in a particularly difficult interference environment vis-à-vis the rest of the country. The technical integrity of the FM airwaves over North Carolina and Virginia is already at a nadir. How elastic does the Commission suppose the concept of integrity to be? Dropping in

⁴⁴ The full analyses of these stations from the *Existing FM Interference Study* are attached hereto as Exhibit 3.

dozens, if not hundreds, of new LPFM stations in North Carolina and Virginia is simply not feasible, either technically or from a public interest point of view.

B. The Effective and Actual Service Area of a Full Power FM Station Extends Far Beyond Its FCC-Protected Contour

At the same time, many broadcasters, including those in North Carolina and Virginia, are able to survive based not on the listeners within their protected contours but rather on those listeners who live, work, and commute in their secondary service area. The current interference standards should not be relaxed for the purposes of LPFM, as the Commission is proposing.⁴⁵ It is clear that by eliminating third adjacent channel interference protection, and possibly second adjacent channel interference protection as well, for LPFM purposes existing, meaningful service to the public will be lost. The elimination of this existing service to the public is clearly not in the public interest.

The effective service area of a broadcast station extends far beyond its protected 60 dBu contour.⁴⁶ A typical car radio can get a good signal when the signal strength is only 40 dBu.⁴⁷ The Commission previously recognized that stations' secondary service areas extended to the 34 dBu (50 uv/m) contour, which "constitutes a usable FM signal" "in rural areas."⁴⁸ And the Commission

⁴⁵ See Notice at ¶¶ 43, 46.

⁴⁶ The protected contours for Class B and B1 stations are the 54 dBu contour and the 57 dBu contour, respectively.

⁴⁷ The secondary service area of FM stations can be meaningfully compared to the Grade B areas of low VHF television stations. Interestingly, the Commission protects television aural carriers, which are FM and which are limited to an ERP of about 7 dB less than the visual carrier, to the television station's Grade B contour. In other words, a low VHF television station's aural Grade B corresponds to a field strength of approximately 40 dBu (the visual carrier's Grade B field strength being 47 dBu).

⁴⁸ *Revision of FM Broadcast Rules*, Notice of Inquiry, Notice of Proposed Rule Making, and (continued...)

has, on numerous occasions, either expressly rejected the naive view that, outside the protected contour, service suddenly stops,⁴⁹ or, conversely, observed that it is “understood that in the absence of interfering signals, usable service is provided well beyond the boundaries of [the protected service] contours.”⁵⁰

In fact, in Docket 14185 the Commission had initially proposed that Class A stations be protected to the 63 uv/m contour (36 dBu), Class B stations be protected to the 178 uv/m contour (45 dBu), and Class C stations be protected to the 84 uv/m contour (38 dBu), believing “that a useful service can be provided with signals of this level.”⁵¹ Although the Commission ultimately did not protect these field strength contours, it adopted tighter protected contours with the understanding that it would “be borne in mind that, in any table of assignments, few spacings will actually be at or very close to the minimum, so that on the average, and in the majority of cases, the degree of protection

⁴⁸(...continued)

Memorandum Opinion and Order, FCC 61-833, 21 Rad. Reg. (P&F) 1655 (1961), at ¶ 65(c)(1). *See also Revision of FM Broadcast Rules*, First Report and Order, 33 F.C.C. 309 (1962), at ¶¶ 57-58 (stating that the then “present FM standards (§ 3.311(b) of the rules) provide that in general a signal of 50 uv/m is sufficient for service to rural areas, and a signal of 1 mv/m is required for service to city, factory, and business areas, with 3 mv/m required over the station’s principal city. . . . [W]e see no reason to change these concepts, and they are reaffirmed.”); *Revision of FM Broadcast Rules*, Third Report, Memorandum Opinion and Order, FCC 63-735, 23 Rad. Reg. (P & F) 1859 (1963), at ¶ 22 (stating that “a median signal of as little as 50 uv/m is adequate to provide service to rural areas”).

⁴⁹ *Revision of FM Broadcast Rules*, Third Report, Memorandum Opinion and Order, FCC 63-735, 23 Rad. Reg. (P & F) 1859 (1963), at ¶ 22.

⁵⁰ *Amendment of Part 73 of the Rules to Provide for an Additional FM Station Class (Class C3) and to Increase the Maximum Transmitting Power for Class A FM Stations*, Notice of Proposed Rule Making, FCC 88-251, 3 FCC Rcd. 5941, 5959 (Appendix B) (1988).

⁵¹ *Revision of FM Broadcast Rules*, Notice of Inquiry, Notice of Proposed Rule Making, and Memorandum Opinion and Order, FCC 61-833, 21 Rad. Reg. (P&F) 1655 (1961), at ¶¶ 47-49.

afforded will be higher.”⁵²

Not only does a station’s effective service area theoretically extend far beyond its protected contour, but a substantial portion—on average, more than *one third*—of a station’s actual listening audience resides outside that protected contour. In other words, a station’s actual service area extends well beyond its FCC-protected contour. NCAB and VAB have obtained customized data from Arbitron showing, by zip code, where Arbitron-surveyed radio listeners reside for seven select Class A FM radio stations in North Carolina and Virginia.⁵³ A summary and analysis of that data are provided in the accompanying Table 4. Those data have also been used to generate contour maps indicating the locations where surveyed radio listeners actually are, based on zip codes.⁵⁴ These maps overlay the predicted 60 dBu, 40 dBu, and 34 dBu contours of each selected radio station over commercially-available zip code maps. On each map, zip code areas colored in red show those areas *outside* the station’s protected 60 dBu contour in which individuals reside who say they actually listen to the station. Zip code areas colored in green show those areas *inside* the station’s protected 60 dBu contour in which individuals reside who say they actually listen to the station. These maps, therefore, empirically demonstrate not merely where a station’s potential audience may be located

⁵² *Revision of FM Broadcast Rules*, First Report and Order, 33 F.C.C. 309 (1962), at ¶ 63.

⁵³ These data are provided in Exhibit 6.

⁵⁴ These contour maps are contained in Exhibit 5.